Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method for controlling a light emitting device ~~in a communications system~~, comprising:

modulating an input of a light emitting device with both a test signal and a data signal to produce a modulated optical output signal, wherein the test signal is a noise ~~having a~~ level ~~commensurate with a noise level~~test signal ~~of the communications system and with data signal to produce a modulated optical output signal~~;

acquiring the modulated optical output signal from the light emitting device;

extracting the test signal from the acquired modulated optical output signal ~~by applying one of a lock-in detection algorithm and a linear sweep algorithm~~;

digitally processing the extracted test signal to calculate one or more power control adjustments; and

controlling output power of the light emitting device by applying the calculated power control adjustments to the light emitting device.

2. (Currently amended) A method for controlling a laser ~~in a communications system~~, the method comprising:

generating a data signal;

generating a test signal having a level commensurate with a noise level ~~of the communications system~~;

modulating a laser bias current with both the test signal and the data signal to produce a modulated laser output;

generating a modulated laser signal from the modulated laser output;

multiplying the modulated laser signal by a sine function of the test signal to generate a first product;

squaring the first product to generate a first squared product;

multiplying the modulated laser signal by a cosine function of the test signal to generate a second product;

squaring the second product to generate a second squared product;

adding the first squared product and the second squared product to generate an extracted test signal;

determining an average value of the extracted test signal;

calculating a laser bias current adjustment from the average value of the extracted test signal; and

applying the calculated laser bias current adjustment to the laser bias current.

3 (Currently amended): The method of claim 2, wherein the test signal is a sinusoidal signal.

4 (Currently amended): The method of claim 2, wherein the test signal is a saw tooth signal.

5. – 8. (Canceled)

9. (Currently amended): An apparatus ~~for controlling a laser in a communications system,~~ comprising:

a laser driver configured to modulate an input of ~~for modulating the~~ a laser with both a data signal and ~~with~~ a test signal to produce a modulated laser output, wherein the test signal is a noise ~~having a~~ level ~~commensurate with a noise level~~test signal ~~of the communications system data signal to produce a modulated laser output from the laser~~;

a monitor photodiode operatively coupled to the laser, configured to acquire~~for acquiring~~ the modulated laser output, and ~~for~~ further configured to generate~~ing~~ a modulated laser output signal from the modulated laser output;

a digital signal processor operatively coupled to the monitor photodiode, configured to ~~for multiplying the modulated laser output signal by a sine function of the test signal to generate a first product, squaring the first product to generate a first squared product, multiplying the modulated laser output signal by a cosine function of the test signal to generate a second product, squaring the second product to generate a second squared product, adding the first~~

~~squared product and the second squared product~~ ~~to~~ generate an extracted test signal from the modulated laser output signal, further configured to~~, determining~~ determine an average value of the extracted test signal, and further configured to calculate~~ing~~ a laser bias current adjustment from the average value of the extracted test signal; and

a servo operatively coupled to the digital signal processor and configured to apply ~~for applying~~ the laser bias current adjustment to the laser.

10. – 11. (Canceled)

12. (Currently amended) A method for controlling a laser system ~~in a communications system~~, the method comprising:

~~providing a data signal;~~

~~embedding a test signal having a level commensurate with a noise level of the communications system in the data signal;~~

~~transmitting the data signal and the embedded test signal from a first laser transceiver to a second laser transceiver;~~

receiving, at a laser transceiver from another laser transciever, a~~the~~ transmitted signal, wherein the transmitted signal includes both a data signal and an embedded test signal, and wherein the embedded test signal is embedded in system noise ~~at the second laser transceiver~~;

detecting, recovering, and digitally processing the test signal at the ~~second~~ laser transceiver by applying one of a lock-in detection algorithm and a linear sweep algorithm to determine a laser characteristic of the ~~first~~ other laser transceiver; and

~~sending~~ transmitting, by the laser transceiver to the other laser transceiver, the laser characteristic ~~from the second laser transceiver to the first laser transceiver;~~

~~receiving the laser characteristic at the first transceiver; and~~ to enable the other laser transceiver to

~~adjusting~~adjust one or more operating characteristics ~~the first laser transceiver~~ according to the ~~received~~ transmitted laser characteristic.

13. – 14. (Canceled)

15. (Currently amended) The method of ~~Claim~~ claim 2, further comprising ~~steps of~~:

calculating a modulation current adjustment from the extracted test signal; and

applying the calculated modulation current adjustment to the laser.

16. (New) The method of claim 1, wherein said extracting comprises applying a phase-sensitive lock-in detection algorithm to the acquired modulated optical output signal.

17. (New) The method of claim 1, wherein said extracting comprises applying a phase insensitive quadrature detection algorithm to the acquired modulated optical output.

18. (New) The method of claim 1, wherein:

said modulating comprises modulating the input of the light emitting device with a gradually increasing system noise-level saw tooth test signal; and

said extracting comprises applying a linear sweep algorthim to the acquired modulated optical output signal.

19. (New) The method of claim 1, wherein said digitally processing comprises determining a ratio of a slope of the test signal being applied to the light emitting device to a slope of the extracted test signal to calculate the one or more power control adjustments.

20. (New) The apparatus of claim 9, further comprising a signal conditioner, operatively coupled to the monitor photodiode configured to function as a coarse filter to isolate noise and the test signal from the modulated laser output signal.

21. (New) The apparatus of claim 9, wherein the monitor photodiode is a high frequency response photodiode configured to track the modulated laser output.

22. (New) The apparatus of claim 9, further comprising a transimpedance amplifier coupled to the monitor photodiode and configured to amplify the modulated laser output signal.

23. (New) The apparatus of claim 9, wherein the laser driver is further configured to modulate the input of the laser with a gradually increasing noise-level sawtooth test signal.

24. (New) The apparatus of claim 9, wherein the digital signal processor is further configured to generate the extracted test signal via application of a phase-sensitive lock-in detection algorithm to the modulated laser output signal.

25. (New) The apparatus of claim 9, wherein the digital signal processor is further configured to generate the extracted test signal via application of a phase-insensitive quadrature detection algorithm to the modulated laser output signal.

26. (New) The apparatus of claim 9, wherein the digital signal processor is further configured to generate the extracted test signal via application of a linear sweep algorithm to the modulated laser output signal.